

REMARKS

Claims 1-5, 11, 15, 16, and 29-35 are pending in this application, of which claims 1, 15, and 29 are independent. In this Amendment, claims 1, 15, and 29 have been amended. Care has been exercised to avoid the introduction of new matter. Support for the amendments of claims 1, 15, and 29 can be found in, for example, pages 15, line 23 to page 16, line 7; and page 22, lines 4-9 of the specification. A Request for Continued Examination is filed concurrently with this Amendment.

Claims 1-5, 11, 15, 16, and the 29-35 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kaneshiro et al. (JP 10-284648, hereinafter “Kaneshiro”) in view of Pechenik et al. (U.S. Patent No. 5,147,446, “Pechenik”).

In the statement of the rejection, the Examiner admitted that Kaneshiro does not teach that the minute projections include a plurality of projections of 1 nm to 20 nm in average diameter and formed in a number density of not less than $0.5 \times 10^3 \mu\text{m}^{-2}$. However, the Examiner asserted that Pechenik teaches the missing features of Kaneshiro and concluded that it would have been obvious to modify the device of Kaneshiro based on the teachings of Pechenik to arrive at the claimed subject matter.

Applicants submit that Kaneshiro and Pechenik, either individually or in combination, do not disclose or suggest a semiconductor module including all the limitations recited in independent claim 1. Specifically, the applied combination, even if it is assumed proper for the sake of this response, does not teach, among other things, the following limitations recited in claim 1:

said insulating base material is provided with minute projections formed on a surface thereof that is in contact with said insulator, the minute projections being

a part of the insulating base material and comprising projections and recesses on a portion of the insulating base material being in contact with the insulator, and

said minute projections include a plurality of projections of 1 nm to 20 nm in average diameter and formed in a number density of not less than $0.5 \times 10^3 \mu\text{m}^{-2}$.

Kaneshiro et al. teaches that a surface of solder resist 5A is roughened (see the abstract), and resin sealed body 12 is in contact with solder resist 5A. Pechenik describes a method for producing full density nano-sized particles. According to the Examiner, the reason why a person skilled in the art would have been motivated to modify the device of Kaneshiro based on Pechenik is “to provide a method of fabricating dense, nearly ideally package compacts of nano-sized particles for the device structure” (the last paragraph on page 3 of the Office Action) (emphasis added).

Applicants emphasize that Pechenik is not directly related to the field of semiconductors because, as mentioned above, the reference simply related to a method for producing full density nano-sized particles (see, e.g., column 2, lines 31-33). Pechenik simply describes, “[u]ltra-fine powders are composed of particles ranging in size from 1.0 to 50 nm” (column 1, lines 15-17), and “[t]his procedure leads to forming an ideally-packed compact of nano-sized particles with a density from about 60 to 100% of the full density” (column 4, lines 37-39).

The Examiner did not explain why Kaneshiro needs Pechenik’s particles in addition to the roughened surface of solder resist 5A. To provide a method of fabricating dense, nearly ideally package compacts of nano-sized particles for the device structure does not explain why a person skilled in the art would have been motivated to provide Pechenik’s particles to solder resist 5A. Further, the cited references do not teach that, and the Examiner did not explain why, a person skilled in the art would have been

motivated to modify the roughened surface of Kaneshiro to have the same size as Pechenik's particles, for example.

In addition, there is no disclosure in Pechenik that the disclosed method is for a "device structure" as asserted by the Examiner, and the Examiner did not provide any support where in the reference teaches a method for a "device structure." Therefore, there is no reasonable support to combine Kaneshiro with Pechenik.

It is noted that merely identifying features of a claimed invention in disparate prior art references does not, automatically, establish the requisite motivation for combining references in any particular manner. *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999); *Grain Processing Corp. v. American-Maize Products Co.*, 840 F.2d 902, 5 USPQ2d 1788 (Fed. Cir. 1988). The Supreme Court noted, "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007). The Examiner's reconsideration of the combination of the references is respectively requested.

Further, Applicants stress that even if the combination of Kaneshiro and Pechenik is proper, the applied combination does not teach the above-cited limitations for the reasons set the forth below.

As repeatedly mentioned above, Pechenik describes a method for producing full density nano-sized particles. This reference does not teach roughening a surface of insulating base material. Therefore, if Kaneshiro and Pechenik had to be combined, Pechenik's particles would be considered to be provided to the surface of solder resist

5A. Neither Kaneshiro nor Pechenik teaches modifying Kaneshiro's roughened surface of solder resist 5A.

In contrast, claim 1 recites that the minute projections is a part of the insulating base material and comprises projections and recesses on a portion of the insulating base material being in contact with the insulator. The claimed minute projections are not particles provided to the insulating base material, but are the insulating base material (i.e., formed by the insulating base material). The cited references does not teach that, and the Examiner did not provide any reasons why, Pechenik's particles can be a part of solder resist 5A of Kaneshiro.

The above discussion is applicable to independent claims 15 and 29, reciting that the minute projections is part of the insulating base material and comprises projections and recesses on a portion of the insulating base material being in contact with the insulator.

Based upon the foregoing, Applicants submit that the Examiner has not established a *prima facie* basis to deny patentability to the claimed invention for lack of the requisite factual basis and want of the requisite realistic motivation. Applicants, therefore, submit that the imposed rejection of claims 1-5, 11, 15, 16, and the 29-35 under 35 U.S.C. §103 for obviousness predicated upon Kaneshiro and Pechenik is not factually or legally viable and, hence, respectfully solicit withdrawal thereof.

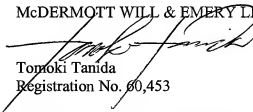
Conclusion

It should, therefore, be apparent that the imposed rejections have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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